

PRUDHOE BAY UNIT

APPLICATION FOR  
THE FORMATION OF THE ORION PARTICIPATING AREA

FINDINGS AND DECISION OF THE DIRECTOR,  
DIVISION OF OIL AND GAS UNDETR DELEGATION OF AUTHORITY  
FROM THE COMMISSIONER,  
DEPARTMENT OF NATURAL RESOURCES, STATE OF ALASKA

February 2, 2004

## TABLE OF CONTENTS

I.	INTRODUCTION, BACKGROUND AND CONCLUSION .....	1
II.	APPLICATION FOR THE FORMATION OF THE ORION PARTICIPATING AREA	1
III.	DISCUSSION OF DECISION CRITERIA .....	2
A.	Decision Criteria Considered Under 11 AAC 83.303(b) .....	3
1.	The environmental costs and benefits of unitized exploration and development .....	3
2.	Geological and engineering characteristics, and prior exploration activities of the proposed participating area .....	4
3.	The applicant's plan for development of the Orion participating area .....	6
4.	The economic costs and benefits to the state and other relevant factors .....	7
4.1	Facility sharing, production allocation and metering .....	7
4.2	Gas disposition .....	7
4.3	Tract allocation schedule.....	8
4.4	Field costs .....	8
B.	Decision Criteria Considered Under 11 AAC 83.303(a) .....	8
1.	Promote the conservation of all natural resources .....	8
2.	The prevention of economic and physical waste .....	9
3.	Protection of all parties .....	10
IV.	FINDINGS AND DECISION .....	10

## **PRUDHOE BAY UNIT**

### **FORMATION OF THE ORION PARTICIPATING AREA**

#### **I. INTRODUCTION, BACKGROUND AND CONCLUSION**

By letter dated October 1, 2003, BP Exploration (Alaska) Inc. (BPXA), as a Working Interest Owner and Unit Operator of the Prudhoe Bay Unit and on behalf of Chevron U.S.A. Inc. (Chevron), ConocoPhillips Alaska, Inc. (ConocoPhillips), ExxonMobil Alaska Production Inc. (ExxonMobil Alaska), and Forest Oil Corporation (Forest) applied to form the Orion Participating Area (OPA) within the Prudhoe Bay Unit (PBU) area (Application). The proposed OPA included portions of fourteen leases for a total of approximately 18,842.375 acres.

Oil was discovered in the proposed OPA in 1968 with the Kuparuk State #1 exploratory well. Over 90 wells have penetrated the Schrader Bluff Formation (Schrader Bluff) in the OPA; nearly all were completed in deeper formations. In 1998, the Northwest Eileen 2-01 well was drilled, confirming hydrocarbons within the Schrader Bluff sands. Two producing wells have been completed within the proposed OPA area in the Schrader Bluff as of October 2003, V-201 and V-202. The two wells are operating and producing as a PBU Tract Operation (the Orion Tract Operation) at a combined production rate in November 2003 of approximately 2500 barrels of oil per day. BPXA utilized data from these wells in conjunction with a 3-D seismic survey to delineate the extent of the Schrader Bluff within the OPA. The geologic, well, and production data that BPXA submitted justifies the formation of the OPA. The data indicate that the Orion Schrader Bluff hydrocarbon accumulation (the Orion Reservoir) is capable of producing or contributing to the production of hydrocarbons in paying quantities.

The Department of Natural Resources (DNR), Division of Oil and Gas (Division), approves the formation of the OPA. The Division also approves the proposed tract allocation schedule for the OPA submitted as Attachment 12 to the Application. The effective date of the formation of the OPA and the OPA Tract Allocation Schedule is February 1, 2004.

#### **II. APPLICATION FOR THE FORMATION OF THE ORION PARTICIPATING AREA**

On September 16, 2003, Division staff attended an OPA pre-application meeting with BPXA and the other PBU working interest owners. BPXA presented various aspects of the proposed OPA, including a technical analysis of the Orion Reservoir, a proposed OPA boundary and tract production allocation factors, a plan of development, and a timetable for OPA activities. BPXA submitted Schrader Bluff, Orion Reservoir, geological, geophysical, and engineering data at this meeting in support of the proposed OPA. In a follow-up to the presentation and materials provided at the meeting, the Division requested additional technical information to understand BPXA's interpretation of the Orion Reservoir.

By letter dated October 1, 2003, BPXA submitted the Application to form the OPA within the PBU. The Application included a lease map of the OPA, proposed OPA participations and tract allocation schedule, the OPA Type Log Well V-201, geological, geophysical and engineering data supporting the area proposed for the OPA, and an OPA plan of development. The

Application also included a letter from BPXA, as Operator of the adjacent Milne Point Unit (MPU), of no objection to approve the formation of the OPA by the Division and the Orion Pool Area by the Alaska Oil and Gas Conservation Commission (AOGCC). The proposed OPA hydrocarbon accumulation is interpreted to extend to the boundary of the MPU Schrader Bluff Participating Area. The letter stated that the MPU has worked with the PBU during the proposed OPA and Orion Pool Area application processes and that the two participating areas and pool areas will not conflict with each other. BPXA, as the MPU Operator, stated that the proposed OPA and Orion Pool area fully comply with 11 AAC 83.303, AS 31.05080, and other applicable state statutes and regulations.

BPXA did not submit an Orion Facility Sharing Agreement (Orion FSA) and Orion Special Supplemental Provisions to the PBU Operating Agreement (Orion SSP) with the Application as is required to formally complete the Application. The Orion SSP was submitted on October 21, 2003, and the Orion FSA was submitted on December 12, 2003.

The proposed 18,842 acre OPA is comprised of portions of fourteen leases: ADL 47447 (Tract 14), ADL 47446 (Tract 15), ADL 25637 (Tract 16), ADL 47449 (Tract 17), ADL 28239 (Tract 18), ADL 28238 (Tract 19), ADL 47450 (Tract 49), ADL 28249 (Tract 50), ADL 28241 (Tract 51), ADL 28245 (Tract 53), ADL 28262 (Tract 54), ADL 28263 (Tract 55), ADL 47452 (Tract 80), and ADL 47453 (Tract 81). All fourteen leases are owned 26.355356 percent BPXA, 36.069385 percent ConocoPhillips, 36.395491 percent ExxonMobil Alaska, 1.1600 percent Chevron, and 0.019768 percent Forest.

Seven leases, ADLs 28238, 28239, 28240, 28241, 28245, 28262, and 28263, were acquired in State Lease Sale Number 14 held on July 14, 1965. The state issued the leases, effective October 1, 1965, on state lease form DL-1, revised October 1963, which provides for a ten-year primary term and 12.5 percent royalty to the state.

Six leases, ADLs 47446, 47447, 47449, 47450, 47452, and 47453, were acquired in State Lease Sale Number 23 held on September 10, 1969. The state issued the leases, effective October 1, 1969, on state lease form DL-1, revised October 1963, which provides for a ten-year primary term and 12.5 percent royalty to the state.

The final lease, ADL 25637, was acquired in State Lease Sale Number 13 held on December 9, 1964. The state issued the lease, effective February 1, 1965, on state lease form DL-1, revised October 1963, which provides for a ten-year primary term and 12.5 percent royalty to the state.

### **III. DISCUSSION OF DECISION CRITERIA**

The Commissioner of the Department of Natural Resources (the Commissioner) reviews applications to form participating areas under AS 38.05.180(p) and 11 AAC 83.303 – 11 AAC 83.395. By memorandum dated September 30, 1999, the Commissioner approved a revision of Department Order 003 and delegated this authority to the Director of the Division of Oil and Gas. The Division's review of the Revised Application is based on the criteria set out in 11 AAC 83.303 (a) and (b). A discussion of the subsection (b) criteria, as they apply to the Revised Application, is set out directly below, followed by a discussion of the subsection (a) criteria.

**A. Decision Criteria Considered Under 11 AAC 83.303(b)**

**1. The environmental costs and benefits of unitized exploration and development**

11 AAC 83.303(b)(1) requires the Commissioner to assess the environmental costs and benefits of the proposed OPA formation. DNR's approval of an initial plan of development for the participating area is only one step in the process of obtaining permission to drill a well or wells or develop the known reservoirs within the unit area. The unit operator also must obtain permits from various agencies before drilling a well or wells or initiating development activities to produce known reservoirs within the unit area. And the operator must obtain DNR's approval of a plan of operations.

State unitization regulations require the Commissioner's approval of a plan of operations before the unit operator performs any field operations. 11 AAC 83.346. A proposed plan of operations must describe the operating procedures designed to prevent or minimize adverse effects on natural resources. When reviewing a proposed plan of operations, the Division will consider the unit operator's ability to compensate the surface owner for damage sustained to the surface estate and the plans for rehabilitation of the unit area.

Orion Reservoir development wells will be drilled from existing PBU drill sites (L-Pad, V-Pad, Z-Pad and W-Pad) and a possible new I-Pad. Existing pad facilities and pipelines will be used to the extent possible to produce Orion fluids to Gathering Center 2 (GC-2) for processing and shipment to Pump Station 1 (PS1). Orion fluids will be commingled with fluids from other producing reservoirs in the PBU West End (PBWE) on the surface at the respective well pads to maximize use of existing infrastructure, minimize environmental impacts, reduce costs, and maximize recovery.

Orion development plans include installation of one new pad, I-Pad, with production, water injection, and gas lift pipelines, power and telecommunications that connect into the existing PBU infrastructure. I-Pad would provide well drilling slots for the most northerly wells in the OPA. L-Pad provides slots for northern and central Orion development; V-Pad provides slots for central and southern Orion development. The most southerly wells in the OPA will be drilled from W-Pad and Z-Pad. To accommodate Orion development wells, W-Pad and Z-Pad may require additional gravel that would be placed within the existing permitted footprint of these well pads.

When the lessees propose further exploration and development of the Orion Reservoir in the Western PBU, DNR will ensure that an updated unit plan of operations complies with the lease stipulations and lessee advisories developed for the most recent North Slope Areawide lease sale. DNR develops lease stipulations through the lease sale process to mitigate the potential environmental impacts from oil and gas activity. These mitigation measures address such issues as the protection of primary waterfowl areas, site restoration, construction of pipelines, seasonal restrictions on operations, public access to, or use of, the leased lands, and avoidance of seismic hazards. Additionally, lease operations may be subject to a coastal zone consistency determination and must comply with the terms of both the state and North Slope Borough coastal zone management plans as appropriate for the proposed activity.

Ongoing mitigation measures such as seasonal restrictions on specific activities in certain areas can reduce the impact on bird, fish and mammal populations. Designating primary waterfowl areas is

one method of protecting the bird habitat. Regulating waste disposal is another way to limit environmental impacts. DNR also requires consolidation of facilities to minimize surface disturbances. With these mitigating measures, the anticipated exploration and development related activity is not likely to significantly impact bird, fish, and mammal populations.

Area residents use the proposed expansion area for subsistence hunting and fishing. Oil and gas activity may impact some wildlife habitat and some subsistence activity. The environmental impact will depend on the level of development activity, the effectiveness of mitigation measures, and the availability of alternative habitat and subsistence areas. In any case, the anticipated activity within the PBU will impact habitat and subsistence activity less than if the lessees developed the leases individually. Unitized exploration, development and production will minimize surface impact.

## **2. Geological and engineering characteristics, and prior exploration activities of the proposed participating area**

A participating area may include only land reasonably known to be underlain by hydrocarbons and known or reasonably estimated through use of geological, geophysical, or engineering data to be capable of producing or contributing to the production of hydrocarbons in paying quantities. 11 AAC 83.351(a). "Paying quantities" means:

quantities sufficient to yield a return in excess of operating costs, even if drilling and equipment costs may never be repaid and the undertaking as a whole may ultimately result in a loss; quantities are insufficient to yield a return in excess of operating costs unless those quantities, not considering the costs of transportation and marketing, will produce sufficient revenue to induce a prudent operator to produce those quantities.

11 AAC 83.395(4).

The Orion Reservoir is located within the northwest corner of the PBU, and comprises the N and O sands of the Schrader Bluff Formation (Schrader Bluff). The Schrader Bluff is Late Cretaceous in age and was deposited as part of a larger accumulation collectively referred to as the Shallow Oil Sands that include the Ugnu and West Sak Sands of the Kuparuk River Unit (KRU) and the Schrader Bluff within the MPU and PBU. The Ugnu, West Sak, and Schrader Bluff sandstones were deposited as southwest-to-northeast prograding marine shoreface and shelf system that was deposited on a relatively flat (one to two degree) extensive open marine shelf. The paleoshelf extended in a northwest-to-southeast direction over the present-day PBU, KRU and MPU. The early Tertiary fluvial deltaic M sandstones overlie the Schrader Bluff sands; they are stratigraphically equivalent to the Ugnu formation in the West Sak development area of the KRU.

In the OPA, the Schrader Bluff sandstones are part of a large homocline that gently dips one to four degrees to the east-northeast. The Schrader Bluff Sands in the OPA occur approximately between the depths of -4,000' to -5,000' tvdss. The area is broken up by two major sets of normal faults: one set of faults trends west-northwest; the other set of faults trends north-northeast. A third set of minor faults trend east-west. Faulting, structure, and stratigraphy define individual oil compartments. The faults break the area into grabens, half-grabens, and horsts that

separate the reservoir into discrete, separate, independent hydraulic units. The hydrocarbon trap is defined to the west and south by the major northwest-trending fault system. Sandstone pinch-outs and faulting define the reservoir to the south and west. The Schrader Bluff accumulation is bounded to the north and east by the down dip intersection of the top of the reservoir sandstones with localized faults. The individual oil traps are defined by structure (up-dip) to the south and west against several west-northwest faults that cut through and seal some of the 'O' and 'N' sandstones. A combination of fault throw, juxtaposing sands against mudstones and siltstones effectively isolate each individual hydraulic unit. The Schrader Bluff formation producing area within the OPA is divided into nine hydraulic units with unique oil-water contacts that are defined by localized fault blocks. The coarsening upward sequences of sandstone, siltstones, and mudstones effectively vertically isolate individual O and M sandstone members within an individual fault block such that each member has its own oil water contact within a given fault block. BPXA used the existing log, log-model, seismic, and fault data to develop a consistent methodology to interpret fluid contacts relative to structural and stratigraphic properties of each hydraulic reservoir compartment to come up with a reasonable estimate of the size and distribution of hydrocarbons to define the OPA. Based on well log evidence, the Schrader Bluff sands in the southern part of MPU S-Pad appear to be in fluid communication with the northern part of the OPA.

The Schrader Bluff Sands have been subdivided into 5 major sand intervals designated as 'O', 'N', 'M', 'L', and 'K' (from oldest to youngest). Each individual sand unit is further subdivided into A (youngest) through F (oldest) members. The 'M', 'L', and 'K' sands are roughly equivalent to the Ugnu Sands in the KRU and are Paleocene (early Tertiary) in age. The 'O' and 'N' sands are equivalent to the West Sak Sands in the KRU and are Maastrichtian (Latest Cretaceous) in age. The N sands and the lower Ugnu Sands likely straddle the Cretaceous-Tertiary boundary in some areas. The O sands are the primary producing sands within the Schrader Bluff formation, with secondary accumulations present locally in thickened 'N' sandstones. BPXA selected the V-201 well as the Orion type log, representative of the N and O sand intervals. The top of the Orion interval is defined at 4,126 feet tvdss (4,549 feet md). The base of the Orion interval is defined at 4,650 feet tvdss (5,106' md). The N sandstone contains three sub-members: the Nc, Nb, and Na members. The O sandstone is subdivided into 7 sub-members: the O<sub>Bf</sub>, O<sub>Be</sub>, O<sub>Bd</sub>, O<sub>Bc</sub>, O<sub>Bb</sub>, O<sub>Ba</sub>, and O<sub>A</sub> (from oldest to youngest). In general, each sandstone member coarsens and cleans upward with the best reservoir sands occurring near the top of the unit. The O<sub>A</sub>, O<sub>B</sub> (O<sub>Ba</sub>), and O<sub>Bd</sub> sandstones are the primary producing intervals in the MPU S-Pad area and the adjoining OPA. The O<sub>A</sub> sands are easily correlated between the northwest Orion area and the MPU S-Pad area. The O<sub>A</sub> sandstone package in the MPU S-Pad area contains a mappable shale marker (TSBC) within the coarsening upward sequence. The O<sub>Ba</sub> sandstone member of the Schrader Bluff formation in Orion is equivalent to the O<sub>B</sub> sandstone member in the MPU Schrader Bluff S-Pad area. BPXA does not use the term O<sub>B</sub> in the Orion area. The O<sub>Bd</sub> sandstone package is present as reservoir rock in both areas and can be correlated between the MPU S-Pad area and the PBU OPA.

The west end of the PBU was the last part of the unit that was developed for Ivishak reserves. Only a few exploration wells were drilled in 1969 with the Ivishak and Lisburne as the primary drilling objectives. The Mobil West Kuparuk St. 3-11-11 well is in the middle; the ARCO Northwest Eileen 1 is in the northern part; the Mobil Kuparuk St. 1 well is in the southern part; and the ARCO Southeast Eileen 1 and 2 wells lie approximately 2 miles to the southeast of the of the proposed OPA. The ARCO Northwest Eileen 2 well (located near the Northwest Eileen 1

well) was drilled in 1972 to a depth of 3,300 feet and, though extensively cored, barely got below the base of the permafrost. Development drilling for Ivishak reserves at the W-Pad to the southeast of the OPA and Z-Pad in the southwestern OPA did not begin until 1988. Development drilling for the Kuparuk C sandstone at L-Pad and V-Pad in the middle of the proposed OPA began in 1998 and 2002, respectively.

Although numerous wells were drilled through the Schrader Bluff interval in the western PBU en route to developing the deeper formations at W-Pad and Z-Pad, the interval was not logged in every well. The first well to log hydrocarbons in the Schrader Bluff interval was the Mobil Kuparuk State #1 well, drilled in 1968. BPXA did not actively drill in the western PBU for Schrader Bluff potential until the late 1990s. The Northwest Eileen 2-01 was drilled and completed in March and April of 1998. The Northwest Eileen 4-01 well was drilled and completed in March and April of 2002. Neither well was tested and both are currently suspended. Both wells contained hydrocarbons, based on log curves, in the Schrader Bluff interval. V-201, a dedicated Schrader Bluff O sandstone conventional, deviated well was drilled and completed in April 2002. The well proved the commercial potential of the Schrader Bluff O sands in the area, when it was fracture-stimulated and initially produced at a rate around 820 BOPD. A second fully dedicated Orion well, V-202 was drilled as a horizontal lateral well and completed in the OBd sand in June 2003. V-202 was placed on production in July 2003 and came on line at a rate averaging around 3,100 BOPD for the first month. Two additional laterals were drilled and completed from V-202 making it a tri-lateral completion. The two additional laterals were in the OA and the OBa sands.

### **3. The applicant's plan for development of the Orion participating area**

Development of the Orion Reservoir will take place from existing PBU drill sites (L-Pad, V-Pad, Z-Pad and W-Pad) and a possible new pad, I-Pad, with production, water injection, and gas lift pipelines and telecommunications that connect into existing PBU infrastructure. I-Pad, planned for the first-half of 2006, would provide drilling slots for the most northerly wells in the OPA. L-Pad provides drilling slots for northern and central Orion development, and V-Pad provides drilling slots for central and southern Orion development. The most southerly development wells will be drilled from Z-pad and W-Pad. Orion Reservoir pressure will be maintained through the early implementation of a waterflood. Enhanced recovery techniques such as miscible gas injection and water-alternating with miscible gas injection will be evaluated for the potential of increasing oil recovery from the reservoir.

Initial development is planned in three phases, beginning near the crest of the structure and progressively moving toward the outer margins of the Orion Reservoir. Phase I development targets the areas with good seismic quality and well control. Phase I drilling is a combination of development and appraisal wells, designed to provide early production and injection well performance information, while evaluating the fluid and rock quality in previously untested areas of the reservoir. V-Pad currently has V-201 and V-202 on production with V-105 on water injection for pressure support. Phase I includes expansion of the development at V-Pad and drilling of at least one L-Pad tri-lateral producer, the L-200 well. A well within the W-Pad area may be drilled in 2004 testing the southeast area of the field.

Phase II development includes the completion of locations that can be drilled from existing gravel pads. This would include drilling of 10-20 producers and 20-40 injectors on the L, V, Z-

Pads. An additional 2 producers and 4-8 injectors may be drilled from W-Pad. Phase III development will target the northwest portion of the field that cannot be reached from L-Pad. A new pad, I-Pad, will be required for this development, and 10-20 producers and 20-40 injectors are envisioned for this most northerly development of the reservoir.

Initial plans are to develop on an average spacing of 160 acres. In its application for the Orion Pool Area to the AOGCC, BPXA requested a minimum well spacing of 20 acres to allow for flexibility in well placement because of local faulting and reservoir stratigraphy. Conservation Order 477 for MPU, Schrader Bluff Oil Pool allows a minimum well spacing of 10 acres. To allow for consistency in the development of the proposed PBU OPA and the MPU Schrader Bluff Participating Area, BPXA recommended to the AOGCC a minimum offset of 500' from external lease boundaries where lease ownership changes may occur. This recommendation for the OPA and Orion Pool Area is consistent with Conservation Order 477.

#### **4. The economic costs and benefits to the state and other relevant factors**

##### **4.1 Facility sharing, production allocation and metering**

BPXA represented to the Division that development of the Orion Reservoir is possible because it will share the existing PBU facilities and infrastructure. Under the proposed plan of development, OPA production will be commingled with IPA production and with production from other reservoirs in the PBU production gathering system before any production passes through a custody transfer meter.

BPXA proposed that Orion production allocation occur under the PBU Western Satellite Metering Plan (WSMP), described in the letter dated April 23, 2002, to the Division and the AOGCC. The WSMP is currently approved for metering and production allocation from the Aurora, Borealis, Polaris, and the Midnight Sun Participating Areas within the PBU. As it will apply to the OPA, production allocation will rely on well performance curves to determine the daily theoretical production from each Orion well. The GC-2 allocation factor will be applied to adjust total Orion production. All new Orion wells will be tested a minimum of two times per month during the first three months of production. A minimum of one test per month will be used to tune the individual well performance curves and to verify the allocation system performance. No natural gas liquids (NGLs), as explained below in Section 4.2, will be allocated to Orion wells.

The AOGCC conditionally approved the WSMP in Conservation Order No. 471 (CO 471), dated May 29, 2002, and Conservation Order No. 505 (CO 505), dated January 5, 2004. The AOGCC conditions for approval of the WSMP are specified in Rule 4 of both CO 471 and CO 505. The Division coordinated its review of the proposed WSMP with the AOGCC, and agrees with the AOGCC conditional approval of the WSMP. The Division approves the WSMP, described above, subject to the same terms and conditions specified in AOGCC Conservation Order No. 471 and Conservation Order No. 505.

##### **4.2 Gas disposition**

In their agreements, the Orion working interest owners have agreed to consider all Orion Reservoir gas delivered into IPA production facilities as having been used in operations as fuel, flared, or lost gas obligations. However, we recognize that there may be more gas produced

beyond that used as fuel, flared or lost. In the Orion POD, the Orion working interest owners state that Orion Reservoir gas not used in operations as fuel, flared or lost, will be injected into the Prudhoe Bay (Permo-Triassic) reservoir. DNR acknowledges that for royalty reporting purposes, the NGLs removed from OPA produced gas will be accounted for and reported as indigenous IPA fluids. Any residue gas from the OPA injected into the Prudhoe Bay (Permo-Triassic) reservoir will be treated as indigenous IPA natural gas for royalty reporting purposes. DNR will allow the Orion working interest owners to give the OPA gas and NGLs to the IPA and the IPA working interest owners will be responsible for royalty payments when the gas is ultimately sold. DNR will allow this arrangement for the OPA because it would be burdensome for the Division and the Orion working interest owners to track and report the relatively small amount of gas produced from the Orion Reservoir, and because the royalty rates are the same for the various PBU participating areas. DNR will consider whether to require a gas disposition report for other participating areas on a case-by-case basis.

### **4.3 Tract allocation schedule**

BPXA submitted a tract allocation schedule that prescribes how the Orion working interest owners plan to allocate the production and costs between the leases in the OPA as required by 11 AAC 83.371 (Attachment 1 to this Findings and Decision). Under the proposed tract allocation schedule, BPXA owns 26.355356 percent, Chevron owns 1.16 percent, ExxonMobil Alaska owns 36.395491 percent, Forest owns 0.019768 percent, and ConocoPhillips owns 36.069385 percent of the production from the proposed OPA. The proposed allocation schedule distributes working interest equity among the lease tracts based on the working interest owners' most likely case original oil in place estimate for all Schrader Bluff formation N and O sands, approximately 1.4 to 1.6 billion reservoir barrels. BPXA's proposed tract allocation schedule is acceptable for allocating production and costs among the leases within the OPA.

### **4.4 Field costs**

Because the OPA approved by this Findings and Decision is within the original PBU boundary, the 1980 Prudhoe Bay Royalty Settlement Agreement governs the field cost allowance for the state's royalty share of production from the OPA.

## **B. Decision Criteria Considered Under 11 AAC 83.303(a)**

### **1. Promote the conservation of all natural resources**

The unitization of oil and gas reservoirs and the formation of participating areas within unit areas to develop hydrocarbon-bearing reservoirs are well-accepted means of hydrocarbon conservation. Without unitization, the unregulated development of reservoirs tends to be a race for possession by competing operators. The results can be 1) overly dense drilling, especially along property lines; 2) rapid dissipation of reservoir pressure; and 3) irregular advancement of displacing fluids. These all contribute to the loss of ultimate recovery or economic waste. The proliferation of surface activity; duplication of production, gathering, and processing facilities; and haste to get oil to the surface also increase the likelihood of environmental damage. Requiring lessees to comply with conservation orders and field rules issued by the AOGCC would mitigate some of these impacts without an agreement to unitize operation. Unitization,

however, provides a practical and efficient method for maximizing oil and gas recovery, and minimizes negative impacts on other resources.

Formation of the proposed OPA will provide a comprehensive plan for developing the Orion Reservoir within the existing PBU. The Orion POD provides for an efficient, integrated approach to development of the Orion Reservoir.

Further, formation of the OPA within the PBU will promote the conservation of both surface and subsurface resources through the unitized (rather than lease-by-lease) development. Unitization allows the unit operators to explore the area as if it were one lease. The formation of a participating area over the Orion Reservoir will allow this area to be comprehensively and efficiently explored and developed. Adoption of the Orion SSP, FSA and POD governing production will help avoid unnecessary duplication of development efforts on and beneath the surface. Facilities can be located to maximize recovery and to minimize environmental impacts, without regard for individual lease ownership.

Producing hydrocarbon liquids from the Orion Reservoir through the existing PBU production and processing facilities will reduce the incremental environmental impact of the additional production. The planned Orion Reservoir development will use the existing PBU western operating area infrastructure of pipelines, roads, pads and processing facilities.

## **2. The prevention of economic and physical waste**

Traditionally, under unitized operations, the assignment of undivided equity interests in the oil and gas reservoirs to each lease largely resolves the tension between lessees to compete for their share of production. Economic and physical waste, however, still could occur without an equitable cost sharing formula, as well as a well-designed and coordinated development plan. Consequently, unitization must equitably divide costs and production, and maximize physical and economic recovery from any reservoir. It must also treat the royalty owner fairly.

An equitable allocation of hydrocarbon shares among the working interest owners discourages hasty or unnecessary surface development. Similarly, an equitable cost-sharing agreement promotes efficient development of reservoirs and common surface facilities and encompasses rational operating strategies. Such an agreement further allows the working interest owners to decide well spacing requirements; scheduling, reinjection and reservoir management strategies; and the proper joint-use of surface facilities. Unitization prevents economic and physical waste by eliminating redundant expenditures for a given level of production, and by avoiding loss of ultimate recovery by adopting a unified reservoir management plans.

Unitized operations greatly improve development of reservoirs beneath leases that may have variable productivity. Marginally economic reserves, which otherwise would not be produced on a lease-by-lease basis, often can be produced through unitized operations in combination with more productive leases. Facility consolidation saves capital and promotes better reservoir management by all working interest owners. Pressure maintenance and secondary recovery procedures are much more predictable and attainable through joint, unitized efforts than would otherwise be possible. In combination, these factors allow less profitable areas of a reservoir to be developed and produced in the interest of all parties, including the state.

Under the PBU Operating Agreement, the required Orion Owner voting interests, 95 percent of the Orion voting interest, have signed the PBU Agreement, the Orion SSP, and the Orion FSA agreeing to share the existing PBU production capacity and the PBU infrastructure. Using the PBU infrastructure and facilities eliminates the need to construct stand-alone facilities to process the recoverable hydrocarbons from the Orion Reservoir. Facility consolidation will save capital and promote better reservoir management through pressure maintenance and enhanced recovery procedures. In combination, these factors allow the Orion reservoir within the PBU to be developed and produced in the interest of all parties.

Forming a participating area over the Orion Reservoir, and allowing this area to access existing unit facilities and infrastructure prevents economic and physical waste.

### **3. Protection of all parties**

The proposed formation of the OPA seeks to protect the economic interests of the Orion working interest owners as well as the royalty owner. Combining interests and operating under the terms of the PBU Agreement, the Orion SSP, and the Orion FSA assures each individual working interest owner an equitable allocation of costs and revenues commensurate with the value of its lease.

Because hydrocarbon recovery will be maximized and additional production-based revenue will be derived from the Orion Reservoir, one aspect of the state's economic interest is promoted. Diligent development and exploration under a single approved unit plan without the complications of competing leasehold interests is certainly in the state's interest. It promotes efficient evaluation and development of the state's resources, yet minimizes impacts to the area's cultural, biological, and environmental resources.

## **IV. FINDINGS AND DECISION**

Considering the facts discussed in this document and the administrative record, I hereby make findings and impose conditions as follows.

1. The formation of the OPA is necessary and advisable to protect the public interest. AS 38.05.180(p) and 11 AAC 83.303.
2. The available geological and engineering data demonstrate that a paying quantities certification is appropriate for the tracts proposed for the OPA. The data also indicates that the acreage is underlain by hydrocarbons and known and reasonably estimated to be capable of production or contributing to production in sufficient quantities to justify the formation of the OPA within the PBU.
3. The available geological and engineering data justify the inclusion of the proposed tracts within the OPA. Under the regulations governing formation and operation of oil and gas units (11 AAC 83.301 - 11 AAC 83.395) and the terms and conditions under which these lands were leased from the State of Alaska, the following lands are included in the OPA:

Tract 14, ADL 47447

T. 12N. R. 11E., Sec. 16: S/2, NW/4, S/2NE/4, 560 acres;  
Sec. 21: All, 640 acres;  
Sec. 22: All, 640 acres;

for a total of 1,840 acres.

Tract 15, ADL 47446

T. 12N. R. 11E., Sec. 17: All, 640 acres;  
Sec. 18: All, 583 acres;  
Sec. 19: All, 585 acres;  
Sec. 20: All, 640 acres;

for a total of 2,448 acres.

Tract 16, ADL 25637

T. 12N. R. 10E., Sec. 13: All, 640 acres;  
Sec. 24: N/2, 320 acres;

for a total of 960 acres.

Tract 17, ADL 47449

T. 12N. R. 11E., Sec. 29: N/2, SE/4, 480 acres;  
Sec. 30: N/2NE/4, 73.5 acres;

for a total of 553.50 acres.

Tract 18, ADL 28239

T. 12N. R. 11E., Sec. 27: All, 640 acres;  
Sec. 28: All, 640 acres;  
Sec. 33: E/2, N/2NW/4, 400 acres;  
Sec. 34: All, 640 acres;

for a total of 2,320 acres.

Tract 19, ADL 28238

T. 12N. R. 11E., Sec. 25: SW/4, 160 acres;  
Sec. 26: All, 640 acres;  
Sec. 35: All, 640 acres;  
Sec. 36: All, 640 acres;

for a total of 2,080 acres.

Tract 49, ADL 47450

T. 11N. R. 12E., Sec. 7: All, 596 acres;  
Sec. 8: NW/4, S/2, 480 acres;

for a total of 1,076 acres.

Tract 50, ADL 28240

T. 11N. R. 11E., Sec. 1: All, 640 acres;  
Sec. 2: All, 640 acres;  
Sec. 11: E/2, E/2NW/4, 400 acres;  
Sec. 12: All, 640 acres;

for a total of 2,320 acres.

Tract 51, ADL 28241  
T. 11N. R. 11E., Sec. 3: N/2, N/2S/2, 480 acres;  
Sec. 4: NE/4, N/2SE/4, 240 acres;  
for a total of 720 acres.

Tract 53, ADL 28245  
T. 11N. R. 11E., Sec. 13: N/2, SE/4, 480 acres;  
Sec. 14: E/2NE/4, 80 acres;  
Sec. 24: E/2NE/4, 80 acres;  
for a total of 640 acres.

Tract 54, ADL 28262  
T. 11N. R. 12E., Sec. 17: All, 640 acres;  
Sec. 18: All, 599 acres;  
Sec. 19: N/2, SE/4, N/2SW/5, 525.875 acres;  
Sec. 20: All, 640 acres;  
for a total of 2,404.875 acres.

Tract 55, ADL 28263  
T. 11N. R. 12E., Sec. 16: SW/4, S/2NW/4, 240 acres;  
Sec. 21: SW/4, S/2NW/4, NW/4NW/4, W/2SE/4, 360 acres;  
for a total of 600 acres.

Tract 80, ADL 47452  
T. 11N. R. 12E., Sec. 28: W/2, W/2E/2, 480 acres;  
for a total of 480 acres.

Tract 81, ADL 47453  
T. 11N. R. 12E., Sec. 29: N/2, N/2SE/2, 400 acres;  
for a total of 400 acres.

The total area within the OPA is approximately 18,842.375 acres.

4. The formation of the OPA divides costs and allocates produced hydrocarbons in a manner currently acceptable to all affected working interest owners, and sets forth a development plan designed to maximize physical and economic recovery from the Orion Reservoir within the approved OPA.
5. Pursuant to 11 AAC 83.351(a) and 11 AAC 83.371(a), the Division approves the allocations of production and costs for the tracts within the OPA under the terms and conditions of Section III (A)(4) of this Findings and Decision.
6. The production of OPA hydrocarbon liquids may be commingled with other PBU production in surface facilities before custody transfer. Facility sharing reduces the environmental impact of the additional production. Use of existing facilities will avoid unnecessary duplication of development efforts on and beneath the surface.

7. The proposed PBU Western Satellite Metering Plan, discussed in Section III (A)(4.1), is approved under the terms and conditions of that section. The Division reserves the right to review the well test allocations to ensure compliance with the methodology prescribed in this decision. The review may include, but is not limited to, inspection of facilities, equipment and well test data.
8. BPXA shall provide the Division with monthly production allocation reports and well test data for the OPA wells by the 20th of the following month. The reports must include a summary of the production allocated to each well for the month and specific well test data for all tests conducted during the month. The Division reserves the right to request any information it deems pertinent to the review of those reports. Moreover, this approval of the allocation methodology is conditioned upon the operator's agreement to reply promptly and fully to any such requests.
9. The OPA is assigned Accounting Unit Code "**PBOR**" for royalty accounting purposes. All operator reports and royalty reports must reference the new Accounting Unit Code. From the production months of April 2002 through January 2004, the Orion Owners have been allocated production for royalty reporting purposes from the Orion Tract Operations for the V-201 and V-202 wells (Accounting Unit Code PB01). Effective February 1, 2004, BPXA, as PBU Operator, and the OPA working interest owners will use Accounting Unit Code **PBOR** to record all production.
10. Diligent exploration and delineation of the Orion Reservoir underlying the approved OPA is to be conducted by BPXA, the PBU Operator, under the plans of development and operation approved by the state. Before undertaking any specific operations, the unit operator shall submit a plan of operations to the DNR and other appropriate state and local agencies for review and approval. All agencies must grant the required permits before drilling or development operations may commence. DNR may condition its approval of a unit plan of operations and other permits on performance of mitigating measures in addition to those in the leases if necessary or appropriate. Requiring strict adherence to the mitigating measures will minimize adverse environmental impacts.
11. The Initial Plan of Development for the OPA meets the requirements of 11 AAC 83.303 and 11 AAC 83.343. However, BPXA did not specify a term or expiration date for the OPA initial plan of development. The initial plan is approved for the period from February 1, 2004 through May 31, 2005. The second plan of development for the OPA is due 90 days before the initial plan expires, that is, March 2, 2005. The second plan must describe the extent to which the requirements of the initial plan were achieved and, if actual operations deviated from or did not comply with the previously approved plan, an explanation of the deviation or noncompliance must be included. It must also provide detailed plans for the term of the second plan and long-range development plans for the OPA. 11 AAC 83.343.

Article 5.4 of the PBU Agreement provides that a participating area will be effective on the first day of the month following approval by DNR or any other date agreed to by DNR and the working interest owners. The common practice with respect to the PBU has been that the effective date for any participating area would be retroactive to the start of pilot test production from a Tract Operation. Pilot test production from the Orion Tract Operations began in April 2002. However, in the case of the OPA, the PBU, OPA and Orion Tract Operation working interest ownership is aligned. There is no need to adjust retroactively the Tract Operation operator and royalty reports with the OPA operator and royalty reports. Consequently, the Division and BPXA, as PBU Operator, agree that approval of the formation of the OPA, and the OPA tract allocation schedule are effective February 1, 2004, the first day of the month in which the DNR approves the OPA.

A person affected by this decision may appeal it, in accordance with 11 AAC 02. Any appeal must be received within 20 calendar days after the date of "issuance" of this decision, as defined in 11 AAC 02.040(c) and (d) and may be mailed or delivered to Tom Irwin, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918, or sent by electronic mail to [dnr\\_appeals@dnr.state.ak.us](mailto:dnr_appeals@dnr.state.ak.us). This decision takes effect immediately. An eligible person must first appeal this decision in accordance with 11 AAC 02 before appealing this decision to Superior Court. A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.

  
\_\_\_\_\_  
Mark D. Myers, Director  
Division of Oil and Gas

2/2/04  
Date

Attachments: 1) OPA Tract Allocation Schedule  
2) Map of the OPA

Orion\_PA\_final2.3.04

## Attachment 1 Orion Participations and Tract Allocations

Tract	Lease	T & R	Section:	Description	Acres	Royalty	Tract Ownership %					Tract Participation %
							BPXA	CPAI	ExxonMobil	Chevron	Forest	
14	047447	12N-11E	Sec 16	S/2,NW/4, S/2NE4	1,840	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	7.476%
			Sec 21	All								
			Sec 22	All								
15	047446	12N-11E	Sec 17	All	2,448	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	22.046%
			Sec 18	All								
			Sec 19	All								
			Sec 20	All								
16	025637	12N-10E	Sec 13	All	960	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	9.811%
			Sec 24	N/2								
17	047449	12N-11E	Sec 29:	N/2, SE/4	553.5	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	1.381%
			Sec 30:	N/2NE/4								
18	028239	12N-11E	Sec 27:	All	2,320	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	12.902%
			Sec 28:	All								
			Sec 33:	E/2, N/2NW/4								
			Sec 34:	All								
19	028238	12N-11E	Sec 25:	SW/4	2,080	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	11.693%
			Sec 26:	All								
			Sec 35:	All								
			Sec 36:	All								

BPXA = BP Exploration (Alaska) Inc.  
ExxonMobil = ExxonMobil Alaska Production Inc.

CPAI = ConocoPhillips Alaska, Inc.  
Chevron = Chevron U.S.A. Inc.

Forest = Forest Oil Corporation

Tract	Lease	T & R	Section: Description	Acres	Royalty	Tract Ownership %					Tract Participation %
						BPXA	CPAI	ExxonMobil	Chevron	Forest	
49	47450	11N-12E	Sec 7: All Sec 8: NW/4, S/2	1,076	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	1.751%
50	28240	11N-11E	Sec 1: All Sec 2: All Sec 11: E/2, E/2NW/4 Sec 12: All	2,320	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	15.797%
51	28241	11N-11E	Sec 3: N/2, N/2S/2 Sec 4: NE/4, N/2SE/4	720	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	1.894%
53	28245	11N-11E	Sec 13: N/2, SE/4 Sec 14: E/2NE/4 Sec 24: E/2NE/4	640	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	0.987%
54	28262	11N-12E	Sec 17: All Sec 18: All Sec 19: N/2, SE/4, N/2SW/4	1,764.875	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	7.607%
54A	28262	11N-12E	Sec 20: All	640	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	4.314%
55	28263	11N-12E	Sec 16: SW/4, S/2NW/4	240	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	0.008%
55A	28263	11N-12E	Sec 21: SW/4, S/2NW/4, NW/4NW/4, W/2SE/4	360	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	0.592%
80	47452	11N-12E	Sec 28: W/2, W/2E/2	480	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	0.373%
81	47453	11N-12E	Sec 29: N/2, N/2SE/4	400	12.5	26.355356%	36.069385%	36.395491%	1.160000%	0.019768%	1.368%

Total = 18,842.375 acres

BPXA = BP Exploration (Alaska) Inc.  
ExxonMobil = ExxonMobil Alaska Production Inc.

CPAI = ConocoPhillips Alaska, Inc.  
Chevron = Chevron U.S.A. Inc.  
Forest = Forest Oil Corporation

# Attachment 2: Lease Map of Orion Participating Area

